



ABSTRACT OF THE DISCLOSURE

Organophosphate pesticide residues in a contaminated sample or substance such as carboxylester organophosphates and dimethyl-oxon organophosphates are eliminated or the concentration is reduced by a method comprising contacting the sample or substance with an enzyme encoded by a DNA molecule comprising a nucleotide sequence having at least 60% homology with Lc α E7, in which the protein encoded by the DNA molecule differs from E3 at least in the substitution of Trp at position 251 with an amino acid selected from the group consisting of Leu, Ser, Ala, Ile, Val, Thr, Cys, Met and Gly. Also provided is an enzyme capable of hydrolyzing at least one organophosphate selected from the group consisting of carboxylester organophosphates and dimethyl-oxon organophosphates, the enzyme being produced by a cell transformed with a DNA molecule encoding a polypeptide having amino acid sequence RM-8Con shown in Fig. 1 or the amino acid sequence of Md α E7 shown in Fig. 3 in which Trp at position 251 is replaced with Ser.